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10/043,457	01/10/2002	Joseph Bibb Cain	GCSD1195 (51244)	6465

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EXAMINER

SCHEIBEL, ROBERT C

ART UNIT

PAPER NUMBER

2666

DATE MAILED: 07/14/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

10/043,457

**Applicant(s)**

CAIN, JOSEPH BIBB

**Examiner**

Robert C. Scheibel

**Art Unit**

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-52 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3,9,12-14,16,22,23,26-28,30,36,39-41,43,49 and 52 is/are rejected.
- 7) ☒ Claim(s) 2,4-8,10,11,15,17-21,24,25,29,31-35,37,38,42,44-48,50 and 51 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_.
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_.

## DETAILED ACTION

### *Response to Arguments*

1. Applicant's arguments, see paragraph 2 on page 17, filed 5/17/2004, with respect to objections to the specification have been fully considered and are persuasive. The objection to the specification has been withdrawn.
2. Applicant's arguments, see paragraph 2 on page 17, filed 5/17/2004, with respect to the rejection of claims 1-12 and 40-52 under 35 U.S.C. 112, second paragraph, (indicated by applicant as "claim informalities" in line 3 of this paragraph) have been fully considered and are persuasive. Claims 1 and 40 were amended to remove indefinite wording with respect to the available time slots. The rejection of claims 1-12 and 40-52 under 35 U.S.C. 112, second paragraph, has been withdrawn.
3. Applicant's arguments see section I "The Claims Are Patentable" on pages 17-20, filed 5/17/2004, with respect to the rejection of claims 1, 3, 9, 12-14, 16, 22-23, 26-28, 30, 36, 39-40, 41, 43, 49, and 52 have been fully considered but they are not persuasive.

Applicant restates the subject matter of the claims in the first 3 paragraphs of this section on pages 17-18. In the next 2 paragraphs on pages 18-19, the applicant summarizes the Lott and Pritchett references used to reject the above stated claims. Examiner generally agrees with the above characterization of the claims and the references. In the remaining 5 paragraphs of the section on pages 19-20, applicant argues that the combination of Lott and Pritchett fails to disclose the claimed subject

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matter. Specifically, applicant asserts that there is no proper motivation to combine Lott and Pritchett. The applicant states that the Lott reference fails to make reference to the network geometry between the mobile nodes or to the impact of the directional interference. The applicant also argues how Pritchett discloses the acquisition of information to create a table of the scheduling time slots among the wireless communication systems. The applicant argues that Pritchett fails to disclose any media access or link protocols and as such, asserts that only in hindsight would the a person of ordinary skill in the art have been motivated to modify Lott in view of Pritchett.

The examiner respectfully disagrees with this argument. Regarding the assertion that Lott fails to consider the problem of directional interference, examiner disagrees. In Figure 3 on page 80 and the accompanying description, Lott discusses the problem of interference on the same time slot in an ad hoc network. Although Lott proposes a different solution to this problem, it is clear that one of ordinary skill in the art would be aware of the problem based upon Lott alone and would have motivation to search for a better solution. Regarding the assertion that Pritchett fails to disclose and media access or link protocols, this is not necessary in order to provide proper motivation to combine. The fact that the problem of interference exists in ad hoc networks (as shown in Lott above) and that Pritchett provides a solution to this problem is sufficient. The original rejection (and that maintained below) states this improvement in interference ("improved signal sensitivity") as the motivation for combining these references. For these reasons, the rejection is maintained herein.

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims **1, 3, 9, 12-14, 16, 22-23, 26-28, 30, 36, 39-40, 41, 43, 49 and 52** are rejected under 35 U.S.C. 103(a) as being unpatentable over "Medium access and radio resource management for ad hoc networks based on UTRA TDD" to Lott, et al in view of U.S. Patent 5,767,807 to Pritchett.

Regarding claims **1, 13, 27, and 40**, Lott discloses the step of scheduling a respective semi-permanent time slot in the third paragraph of section 5.1. In this section, Lott discloses reserving a small amount of capacity permanently. This is analogous to applicant's semi-permanent time slots. Lott further discloses the limitation of claims 1 and 40 that there be  $N$  semi-permanent slots and at least  $2N-1$  available slots. Consider the example when there are 2 pairs of nodes, each node using up a permanent connection ( $N=2$ ). According to Lott, there are 60 time slots per super frame, so there would be much greater than  $2N-1$  available slots. Lott discloses the step of scheduling the at least one available time slot based on communications demand in the third paragraph of section 5.1. Here, Lott indicates that when the user needs more capacity than is provided by the permanent connection, this channel is used to request additional capacity. It is also clear from the title, abstract and

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introduction that Lott is describing a method for use in an ad hoc network of mobile nodes.

Lott fails to disclose expressly that these mobile nodes are comprised of a transceiver, a phased array antenna, and a controller. Lott also fails to disclose expressly the step of aiming.

Pritchett discloses a directional (phased-array) antenna in figure 1. Pritchett also discloses the transceiver and the controller in the CPU 34 of figures 6 and 7. Pritchett discloses that the CPU 34 is used in transmitting and receiving a radio signal (transceiver) in lines 57-60 of column 6. Pritchett also discloses the aiming unit (claims 1 and 9) and the step of aiming (claims 17 and 25) in the CPU 34 of figure 7. Pritchett describes in 25-42 of column 7 that the CPU controls the direction of the antenna. Pritchett.

Lott and Pritchett are analogous art because they are from the same field of endeavor of mobile ad hoc networks. At the time of the invention it would have been obvious to a person of ordinary skill in the art to add the directional antenna, transceiver and processor of Pritchett to Lott. The motivation for doing so would have been to provide the advantage of improved signal sensitivity and angular discrimination as suggested by Pritchett in the abstract.

Therefore, it would have been obvious to combine Pritchett with Lott for the benefit of improved signal sensitivity and angular discrimination to obtain the invention as specified in claims 1, 13, 27, and 40.

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Regarding claims **14 and 28**, Lott discloses the limitation that there be  $N$  semi-permanent slots and at least  $2N-1$  available slots. Consider the example when there are 2 pairs of nodes, each node using up a permanent connection ( $N=2$ ). According to Lott, there are 60 time slots per super frame, so there would be much greater than  $2N-1$  available slots.

Regarding claims **23 and 41** with the features of the parent claims addressed above, Pritchett discloses limitation of the directional antenna being a phased array antenna; the antenna of Figure 1 Pritchett (used in the rejection of the parent claims above) is a phased array antenna.

Regarding claims **9, 22, 36, and 49** with the features of the parent claims addressed above, Pritchett discloses the limitation of using an omni-directional antenna to exchange positional information in steps 1-4 of figure 11. Lott and Pritchett are analogous art because they are from the same field of endeavor of mobile ad hoc networks. At the time of the invention it would have been obvious to a person of ordinary skill in the art to add the omni-directional mode of Pritchett to Lott for the purpose of determining the location of other mobile nodes prior to setting the direction of the phased-array antenna. The motivation for doing so would have been to provide the advantage of improved signal sensitivity and angular discrimination as suggested by Pritchett in the abstract. Therefore, it would have been obvious to combine Pritchett with Lott for the benefit of improved signal sensitivity and angular discrimination to obtain the invention as specified in claims 1, 13, 27, and 40.

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Regarding claims **12, 26, 39, and 52** with the features of the parent claims addressed above, Lott discloses the limitation of a plurality of communication links being established within a semi-permanent time slot where each link is to a different pair of nodes in the description of figure 4 at the top of column 2 on page 80. In the example, slot 12 is used to communicate with the pair S3-S1 and with the pair S3-S2.

Regarding claims **3, 16, 30, and 43** with the features of the parent claims addressed above, Lott discloses the limitation of scheduling time slots based on prioritization in section 5.5. If a request for high priority traffic arrives, it can use one of the reserved high priority time slots even if the remaining time slots are currently occupied.

#### ***Allowable Subject Matter***

6. Claims **2, 4-8, 10-11, 15, 17-21, 24-25, 29, 31-35, 37-38, 42, 44-48, and 50-51** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

#### ***Conclusion***

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

"Transmission Scheduling in Ad Hoc Networks with Directional Antennas" by Bao et al discloses the use of directional antennas in ad hoc networks.



U.S. Patent 5,487,069 to O'Sullivan et al and copending application US-2003/0152986 by El Batt teach the use of directional antennas in a peer-to-peer wireless network.

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Robert C. Scheibel whose telephone number is 703-305-9062. The examiner can normally be reached on 6:30-3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Seema S. Rao can be reached on 703-308-5463. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

*RCS 7-1-04*

Robert C. Scheibel  
Examiner  
Art Unit 2666



DIVISION  
PATENT EXAMINER